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Improvement of topotecan sensitivity of MCF-7 breast cancer cell line by inhibition of IL1 signaling cascade

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Background and Aim : Breast cancer is the most common type of cancer among women. Chemotherapy is a principal method in treatment of breast cancer. Unfortunately efficacy of chemotherapy is affected by Multidrug resistance which induced by ABC transporters. Another important factor in drug resistant is inflammation. IL.1 is a proinflammatory cytokine and in this study we evaluated the topotecan sensitizing effects of IL.1 signaling inhibition. **Methods :** The MCF7 breast cancer cell line was cultured in DMEM medium supplemented with 10% fetal bovine serum. IC50 of topotecan in presence or absence of anti-inflammatory agent (200 nM(was determined in 96 well microplate by WST1. For assessing the role of this inhibitor on the BCRP and P.gp gene expression level, mRNA was extracted by column chromatography method after 6,12 and 24h treatment of the cells by IL.1 signaling inhibitor. After cDNA synthesis, gene expression level was assayed by RT QPCR. Apoptosis or necrosis of dead cells was evaluated by flow cytometry after treatment of the cells by 1 µg/ml topotecan and 200 nM of IL.1 signaling inhibitor. **Results :** Our results were shown that IL.1 signaling inhibitor can increase drug sensitivity of the MCF7 breast cancer cell line to topotecan exceed of 100-fold. topotecan (1µg/ml) can induce more than 80% cell death in this cell line, while topotecan (100µg/ml) alone has little effect on apoptosis induction. Flow cytometry results also was elucidated for us more than 89% of dead cells were sustained apoptosis. **Conclusion :** our results in this study illustrated that suppressing of IL.1 signaling cascade has surprising effects on increasing of topotecan sensitivity of MCF7 breast cancer cell line and maybe used for combination therapy of cancer in the future after further studies.
Keywords : mutidrug resistance, cancer, topotecan